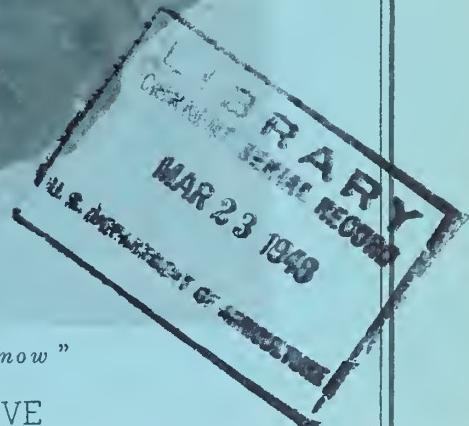


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"Western Treasure -- Deep, Wet Snow"

FEDERAL-STATE COOPERATIVE
SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

COLORADO RIVER DRAINAGE BASIN

MARCH 1, 1948

By

Division of Irrigation, Soil Conservation Service

United States Department of Agriculture

and

Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.

WATER SUPPLY OUTLOOK

COLORADO RIVER DRAINAGE

March 1, 1948

Snow cover on the headwaters of the Colorado River and its tributaries in Colorado, as shown by March 1 snow surveys, was normal or slightly above at high elevations. In the valley areas the ground is covered with snow to a greater extent than usual due to cold weather and higher than average precipitation. Soil moisture is reported as good and stream flow is generally above normal except in extreme southwest Colorado. On the Green River watershed in Wyoming there is a deficiency in snow accumulation to date.

Drought conditions in Arizona and western New Mexico have been somewhat relieved during February but reservoir storage is still very low. Soil moisture conditions in irrigated areas are temporarily good due to recent rains.

COLORADO RIVER AND TRIBUTARIES IN COLORADO

Colorado River (Above Grand Junction). The snow cover on the Colorado River watershed, above Grand Junction, is 7 percent above normal and about the same as last year. The distribution of snow water storage over the watershed follows a general average pattern with no extreme deficiencies or surplus. At low and medium elevations precipitation has been above normal and snow melt has been light to date. Stream flow at Grand Junction is reported as about average. The irrigated and range areas have been snow covered much of the time during the winter. Storage in Green Mountain reservoir is now 7 $\frac{1}{4}$,500 acre-feet, the same amount as on March 1, 1947. The present outlook for flow of the Colorado at Grand Junction is for 10 to 25 percent above normal.

Gunnison River. The water supply situation on the Gunnison is now quite favorable. Although the snow water content measured on courses at high elevations is slightly under normal and last year, precipitation at low elevations has been high. During February up to three times normal precipitation was reported in valley areas. Stream flow is currently 20 percent over average. Soil moisture conditions in the Uncompahgre valley are excellent. A slight deficiency in snow cover is indicated for the North Fork. Storage in Taylor Park reservoir is 89,200 acre-feet as compared to 63,400 on March 1, 1947.

Yampa and White Rivers. Snow water content measured on courses on the watershed of the Yampa river March 1, was 8 percent above average and 10 percent over a year ago. The valley area is snow covered and recent temperatures have been colder than usual. Stream flow is about normal. On the headwaters of the White River a slight deficiency of snow cover is indicated but on the whole the water supply outlook for this stream is about average.

San Juan and Animas Rivers. In opposition to the snow pattern for the past three seasons the water supply outlook on the San Juan and Animas rivers is much above other tributaries to the Colorado River. During February there was record or near record snow accumulation in the mountains on this watershed from Wolf Creek Pass west along the Continental Divide and on to the headwaters of the Animas and its tributaries. Upper San Juan course measured 113 inches of water and 32 inches of snow to set a record depth for March 1, since 1935. Similar conditions were reported from Cascade snow course on the Animas River. Precipitation at lower elevations has been above normal and soil moisture conditions are excellent. Storage in Vallecito Reservoir is now 66,000 acre-feet. A year ago it was 58,300.

Dolores River. From limited snow surveys on the headwaters of the Dolores River the snow water content is about normal and 11 percent above March 1, 1947. Snow covers the ground at lower and medium elevations. Recent precipitation has been about average. Soil moisture conditions in the Dolores, San Miguel and Montezuma valleys are reported as good. Storage in Groundhog reservoir is 11,000 acre-feet, 3,000 above last year at this time.

GREEN RIVER IN WYOMING

On the basis of March 1 snow surveys on the Green River watershed in Wyoming a definite deficiency of snow cover is reported. The average snow water content is 74 percent of last year and 82 percent of normal. Precipitation over the range area has been near average during the winter months. No surveys were made west of Big Piney but the water content of the snow at East Rim Divide course and other precipitation records indicates better or near normal snow conditions in that area.

COLORADO RIVER AND TRIBUTARIES IN ARIZONA

The drought condition that has existed in Arizona for the past two seasons was somewhat relieved during February. The snow water content, as of March 1, was substantially above normal on most snow courses on the Gila, Salt, Little Colorado and Verde Rivers. Precipitation was reported as above normal in the irrigated areas the last two weeks of February. However, more than the temporary favorable conditions will be necessary to remedy the long continued period of drought in Arizona. Reservoir storage is extremely short and groundwater tables have been lowering. Stream flow is reported as below average. Unless heavy precipitation continues the water supply will still be short. Storage in the four major reservoirs on the Salt River is about 231,000 acre-feet as compared to 837,000 as an average for the past ten years. San Carlos reservoir is nearly empty.

Net storage in Lake Mead as of March 1 was 19,148,000 acre-feet, about 2,450,000 above last year on that date.

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

COLORADO RIVER BASIN

STATUS OF RESERVOIR STORAGE, MARCH 1, 1948

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous. ⁴ Ft.)	THOUSANDS ACRES FEET IN STORAGE About March 1, 1948					10-year-avg. 1937-46*
			1948	1947	1946	1945	March 1, 1948	
COLORADO DRAINAGE								
Taylor River	Taylor Park	106.2	89.1	68.4	53.4	60.9	59.1	
Los Pinos River	Vallecito	126.3	65.9	58.3	38.7	5.1	31.6	
Groundhog Creek	Groundhog	21.7	11.0	8.0	5.5	8.0	10.4	
Blue River	Green Mountain	146.9	74.5	74.7	66.8	70.1	52.6	
Colorado River	Lake Mead	27935.0	19148.0	16692.0	13275.0	19790.0	19867.4	
Colorado River	Lake Havasu	683.0	591.0	609.7	588.4	642.6	546.8	
SALT AND GILA DRAINAGE								
Salt River	Roosevelt	1420.0	30.6	133.6	433.8	606.9	580.2	
"	Horse Mesa	245.1	161.9	229.0	224.3	223.4	190.7	
"	Mormon Flat	58.0	25.8	39.0	31.4	35.5	39.1	
"	Stewart Mt.	70.0	13.1	28.1	10.8	22.2	27.0	
Bartlett		200.0	8.3	11.3	1.8	15.6	58.9	
Verde River	Carl Pleasant	173.0	9.5	3.0	3.6	8.3	20.5	
Aqua Fria River	San Carlos	1200.0	1.3	18.3	29.9	107.5	249.3	

*Some for shorter periods

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
COLORADO RIVER BASIN

March 1, 1948

SUMMARY OF MARCH 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS
YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth				Water Content				Snow Density				1948 Water Content in percent of previous year Avg.*			
	Thirteen year Avg.*	1947	1948	Thirteen year Avg.*	In.	In.	In.	In.	Number Courses in Average	Percent in Year Avg.*	Percent in 1947	1948 Percent in 1947	1948 Percent in Thirteen year Avg.*	1947		
COLORADO RIVER**																
Colorado River**	42.5	In.	In.	11.8	47.1	10.9	11.8	11.7	21	26	23	25	107	99		
Yampa River	50.7	In.	In.	61.6	55.3	14.0	13.7	15.1	4	28	22	27	108	110		
White River	47.2			65.7	50.8	13.4	14.6	12.6	2	28	22	25	94	86		
Roaring Fork	34.0			42.4	37.2	7.8	8.0	8.2	2	23	19	22	105	102		
Gunnison River	46.6			52.2	47.9	12.5	13.0	12.4	10	27	25	26	99	96		
Uncompahgre River	38.6			45.6	45.0	11.0	11.3	11.3	1	29	25	25	103	100		
Dolores River	33.6			33.2	41.5	5.0	7.0	7.8	2	24	21	19	97	111		
San Juan River	41.2			35.1	54.7	11.7	9.9	14.8	7	28	26	27	126	139		
Animas River	32.4			38.3	44.6	8.4	8.5	10.8	3	26	22	24	129	127		
Gila River	7.5			30.0	16.6	2.0	0	3.5	7	27	21	21	175	—		
Salt River	7.2			1.4	11.8	2.0	0.3	2.4	5	28	21	20	120	800		
Green River	36.5			40.4	32.7	10.1	11.2	8.3	4	28	25	25	82	74		

** Above Grand Junction *Some for shorter periods.

P R E C I P I T A T I O N D A T A

WATERSHED	STATE	Precipitation* October 1 to February 29	Departure from Normal	Precipitation*			Departure from Normal	Departure from Normal
				Inches	Inches	February		
Colorado								
Colorado	Colorado	Inches	Normal	Inches	Inches	February	Inches	Inches
Green	Wyoming	8.23	+0.74	2.10	+0.36			
San Juan	New Mexico	3.52	-0.04	0.62	-0.01			
Colorado	Arizona	6.20	-0.23	1.71	+0.19			
Gila	New Mexico							

The accumulated precipitation since October 1 over the watershed of the Colorado River was below normal except for the Colorado River in Colorado. In February precipitation was above normal except for a slight deficiency on the Green River in Wyoming.

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COLORADO RIVER SNOW SURVEYS, MARCH 1, 1948

SNOW COVER MEASUREMENTS

DRAINAGE BASIN and SNOW COURSE	LOCATION				Date or Survey	Snow Depth (Inches)	COLORADO RIVER	Water Content (Inches)	Years or Record	Av. Water Content (Inches)	Past Record
	No. and State	Sec.	Twp.	Range							
COLORADO RIVER (Above Grand Junction)											
Park View*	7 Colo.	24	5N	73W	9200	3/2	35.3	7.1	13	7.2	
Phantom Valley	12 "	7	5N	75W	9300	3/2	41.6	7.6	13	6.3	
Berthoud Pass	16 "	35	2S	80W	9700	3/1	51.6	12.2	13	12.4	
Tennessee Pass*	19 "	21	5S	82W	10200	2/26	36.0	16.0	13	7.3	
Ind. Pass Tunnel	33 "	30	11S	37W	10200	3/2	49.3	11.6	13	10.2	
N. Lost Trail Cr.	34 "	29	11S	77W	9000	2/27	30.9	17.4	13	10.7	
M. Fork Camp Gr.	37 "	16	8S	30W	11000	2/26	50.9	10.8	13	7.8	
Fiddler Gulch	44 "	1	9S	63W	8700	2/1	25.2	12.5	13	11.9	
Nast	45 "	1	11S	96W	10000	3/4	60.2	14.7	13	11.5	
Mesa Lakes	56 "	35	11S	96W	10200	2/28	47.1	15.7	12	13.2	
Lulu	59 "	25	14N	78W	9500	3/2	46.3	10.9	11	13.2	
Willow Creek P.	62 "	21	26	4N	9000	3/1	41.0	10.0	11	9.2	
N. Inlet Grand L.	64 "	26	5N	75W	10600	2/29	70.1	10.1	11	7.3	
Lake Irene	65 "	28	8S	75W	10500	2/29	19.5	13.4	11	15.7	
Thunderbolt Peak	66 "	22	2N	74W	9500	2/29	16.5	15.8	11	13.1	
Arrow	69 "	34	1S	75W	9900	2/27	48.3	12.0	11	13.1	
Japland	70 "	16	2S	76W	9300	2/27	43.2	13.6	11	13.1	
Fremont Pass #2	79 "	11S	8S	79W	11400	2/25	53.8	13.6	11	8.6	
Trickle Divide	85 "	23	2N	94W	10000	3/1	69.5	19.7	13	12.0	
Lynx Pass No. 2	91 "	27	6S	83W	9100	3/21	47.8	13.3	9	20.9	
Shrine Pass	96 "	15	6S	79W	10500	2/26	55.8	14.7	13	10.5	
Grizzly Peak	97 "	2	5S	76W	11250	2/25	46.5	12.5	7	14.3	
Ivanhoe	100 "	12	9S	32W	10400	2/27	36.8	15.0	7	13.1	
Glen-Mar Ranch	102 "	31	12S	77W	8850	2/27	42.6	16.9	3	14.8	
Monarch Lake	106 "	30	2N	74W	8500	2/28	47.1	8.6	2	10.6	
Average for drainage											10.2
YAMPA RIVER											
Dry Lake	6 Colo.	26	7N	84W	8200	3/1	51.3	14.8	10	14.9	
Columbine Lodge*	"	21	5W	32W	9300	2/29	72.9	18.0	13	17.8	
Elk River	6 "	6	10W	85W	8700	2/29	49.3	14.2	10	12.8	
Lynx Pass No. 2*	9 "	27	2N	83W	9100	3/2	47.8	13.3	13	10.6	
Average for drainage											14.0
WHITE RIVER											
Burro Mountain	35 Colo.	15	2S	91W	9000	3/1	56.4	14.3	13	14.2	
Rio Blanco	"	28	1N	88W	8500	3/1	45.2	11.0	10	11.8	

*On adjacent drainage

*On adjacent drainage

COLORADO RIVER SNOW SURVEYS, March 1, 1948

DRAINAGE BASIN and SNOW COURSE	SNOW COURSE MEASUREMENTS									
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Years of Record	Past Record Av. Water Content (Inches)
DOLORES RIVER										
Rico	23 Colo.	11	39N	11W	8700	2/27	—	—	10	6.8
Telluride	24 "	6	42N	8W	8600	—	43.0	4.1	10	—
Lizard Head	25 "	24	41N	10W	10300	—	—	6.3	10	—
Lone Cone	90 "	23	41N	13W	8900	3/1	40.0	13.4	8	9.7
ANIMAS RIVER										
Silverton SS	30 Colo.	10	41N	7W	9400	2/27	21.9	4.7	10	4.6
Cascade	31 "	12	39N	9W	8350	2/29	66.8	16.5	10	9.6
Ironton Park*	58 "	29	43N	9W	9800	3/5	45.0	11.3	12	11.0
GILA RIVER										
Frisco Divide	11 N. Mex.	31	6S	20W	8000	2/27	23.8	4.7	11	2.2
State Line	14 "	6	6S	21W	8000	2/27	19.9	3.7	11	2.4
Taylor Creek	22 "	20	10S	10W	7850	3/1	1.2	0	0	0.3
Inman	23 "	6	11S	10W	7300	3/1	6.5	1.8	7	0.6
Nutrioso	3 Ariz.	23	6N	30E	8500	2/27	14.8	3.4	3	0.6
Beaver Head	4 "	13	4N	30E	8000	3/1	24.2	5.0	11	2.0
Coronado Trail	5 "	26	5N	30E	8000	2/27	20.0	4.1	10	3.0
SALT RIVER										
McNary	6 Ariz.	14	8N	23E	7200	3/1	11.5	1.6	10	2.4
Forestdale	7 "	2	9N	21E	6000	3/1	6.3	1.5	10	1.1
Milk Ranch	9 "	28	8N	23E	7000	3/1	6.6	1.6	7	1.1
Nutrioso*	3 "	23	6N	30E	8500	2/27	14.8	3.4	11	2.0
Coronado Trail*	5 "	26	5N	30E	8000	2/27	20.0	4.1	11	3.3

*On adjacent drainage

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COLORADO RIVER SNOW SURVEYS, March 1, 1948

DRAINAGE BASIN and SNOW COURSE	LOCATION				SNOW COURSE MEASUREMENTS						
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	COLORADO RIVER	Water Content (Inches)	Years of Record	Past Record Av. Water Content (Inches)
VERDE RIVER											
Iron Springs*	11 Ariz.	22	14N	3W	6200	2/26	4.0	1.0	0	3	0.3
Camp Wood	12 " "	3	16N	6W	5700	3/1	0	0	0	2	0
Mingus Mountain	" "	3	15N	22	7100	3/1	8.0	1.5	0	2	0.7
Mormon Lake*	" "	13	18N	32	7350	3/1	35.8	8.2	0	2	4.1
Fort Valley*	" "	22	22N	65	7350	3/1	6.1	1.0	0	2	0.5
Chalender*	" "	27	22N	32	7100	3/1	13.2	3.5	0	2	1.8
LITTLE COLORADO RIVER											
Forestdale*	7 Ariz.	2	9N	21	6000	3/1	6.3	1.5	0	10	1.1
McMary	6 "	14	8N	23	7200	3/1	11.5	1.6	0.8	10	2.4
Nutrioso*	3 "	23	6N	30	8500	2/27	14.8	3.4	0	11	2.0
Mormon Lake	" "	13	18N	32	7350	3/1	35.8	6.2	0	2	4.1
Fort Valley	" "	22	22N	65	7350	3/1	6.1	1.0	0	2	0.5
Bright Angel	Ariz.	34	33N	32	8400	3/1	30.1	6.0	0	1	—
Grand Canyon	" "	21	30N	42	7500	2/1	6.1	3.5	0	1	—
WILLIAMS RIVER											
Iron Springs	11 Ariz.	22	14N	3W	6200	3/1	4.0	1.0	0	3	0.3
Camp Wood*	12 "	3	16N	6W	5700	3/1	0	0	0	2	0
Willow Ranch	" "	16	21N	11W	5000	3/1	0	0	0	2	0
GREEN RIVER											
Mulligan Park	24 Wyo.	17	35N	103W	8900	2/28	28.6	6.4	12.5	7.	8.9
Kendall R. S.	25 "	23	38N	110W	7900	2/28	26.9	5.7	9.1	7.	9.6
Loomis Park	26 "	14	37N	111W	8500	2/28	44.2	15.8	15.0	7.	13.1
East Rim Divide	24 "	32	37N	111W	7950	2/26	31.0	9.1	8.2	7.	8.9
											10.1
Average for drainage											11.7

*On adjacent drainage

The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE

Colorado State Engineer
Wyoming State Engineer
Utah State Engineer
New Mexico State Engineer
Montana State Engineer
Nebraska State Engineer
Colorado Experiment Station
Colorado Extension Service
Montana Experiment Station
Utah Experiment Station

FEDERAL

Department of Agriculture
Forest Service
Soil Conservation Service
Department of Interior
Bureau of Reclamation
Geological Survey
National Park Service
Department of Commerce
Weather Bureau
War Department
Army Engineer Corps

PUBLIC UTILITIES

Colorado Public Service Company
Western Colorado Power Company
Montana Power Company
Public Service Company of New Mexico
Denver and Rio Grande Western R. R. Company

MUNICIPALITIES

City of Bozeman
City of Denver
City of Boulder

WATER USERS ORGANIZATIONS

Poudre Valley Water Users' Association
Arkansas Valley Ditch Association
Colorado River Water Conservation District

IRRIGATION PROJECTS

Farmers Reservoir and Irrigation Company
San Luis Valley Irrigation District
Santa Maria Reservoir Company
Costilla Land Company
Uncompahgre Valley Water Users' Association
Wyoming Development Company
Goshen Irrigation District
Kendrick Project
Pathfinder Irrigation District
Salt River Valley Water Users' Association
San Carlos Irrigation and Drainage District
Twin Lakes Reservoir and Canal Company

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